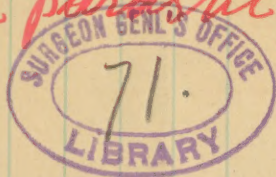


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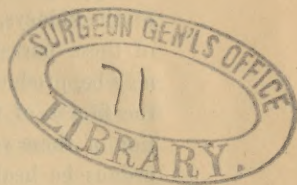
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ON THE

PARASITIC FORMS DEVELOPED IN PARENT EPITHELIAL CELLS OF THE URINARY AND GENITAL ORGANS, AND IN THEIR SECRETIONS.

By J. H. SALISBURY, M. D.

(WITH THIRTY-FOUR ILLUSTRATIONS.)



THE parent epithelial cells, lining the genital and urinary organs, under certain conditions, afford a fertile soil for the development and propagation of some low cryptogamic forms; and in the secretions of these parts there are occasionally found, multiplying rapidly, animal organisms of inferior types. These parasites all produce more or less irritation, deranging the physiological functions of the parent cell. Hence there is, not only excessive cell activity and secretion; but the resulting products are pathological in quantity and kind, and frequently cell death and disintegration result. The parts become irritated and inflamed with catarrhal discharge; and frequently thickened and indurated. The induration of the womb, when considerable, may sometimes be mistaken for scirrhus. The secretions are for the most part free from offensive odour; but thick, translucent, and gelatinous. They are composed of detached parent epithelial cells, and pathological mucus. In the parent epithelial and mucous cells, and in the fluid part of the secretions, are found developing in greater or less numbers fungoid and algoid spores, and frequently embryonic filaments.

When the spores are numerous in the cells, the nucleus and granules of the normal cell are often entirely absent, being destroyed by the presence of the parasites. This is more especially the case, where the spores exist in the mucous cells (fig. 32). Under the influence of spore development, these cells tend to develop in broad filaments, with the spores arranged irregularly along the cavity (fig. 11).

As the secretions from the womb pass over the external parts, the spores frequently become planted in the cells of the external mucous membrane, where they rapidly develop, producing a most troublesome and often intense pruritus, especially at night; and if the parts be scratched to relieve this, the burning and itching are aggravated.

These parasites, under certain pathological conditions of the secretions, frequently are transplanted and develop in the tender epithelium of the prepuce and glans penis, producing there severe pruritus. The vegetation here produces minute papulæ, surrounded by an inflamed base; the epithelium becomes frequently abraded, and superficial excoriations result. This constitutes one form of balanitis. In certain states of the secretions which favour their growth, these vegetations attack the epithelium of the urethra, producing urethritis, resembling gonorrhœa.

Cryptogamic vegetation is sometimes found developing in the epithelium of the kidneys, ureters, bladder, and urethra. In such states, some forms of these parasites occasionally attack the vulva or prepuce, as the case may be, producing more or less severe and obstinate pruritus, according to the fitness of the secretions of these parts for the growth and propagation of these vegetations. If the epithelium of the urinary and genital organs be healthy, these parasites, most likely, would not become developed, unless planted there with the fermenting secretions from similar surfaces already infected; and even then but seldom. If, however, the system is out of order, and the secretions of these parts abnormal, the spores when planted rapidly multiply.

CRYPTOGAMIC PARASITES. I. *Penicillium pruriosum* (Salisbury).—This is sometimes found developing in and on the epithelium of the womb, bladder, ureters, kidneys, and urethra, and occasionally in and on that of the vulva and prepuce. Its development in these parts always produces more or less irritation. When existing to any extent in the cells of the vulva and prepuce it produces severe pruritus. In the latter locality it becomes the cause of one form of balanitis. In a few instances, I have found this vegetation exciting quite severe urethritis. This plant is represented at figs. 1, 2, 3, and 4. Fig. 1, spores. Fig. 2, spores developing in a parent epithelial cell of the bladder. Fig. 3, mycelium of the fungus. Fig. 4, a fertile thread in fruit.

II. *P. glaucum*.—This species is occasionally met with in the urinary apparatus. I have found it mainly in patients recovering from long-continued attacks of miasmatic fevers. It seems to be developed, more as a consequence of certain diseased states of the secretions, than as a cause of them. So far as I have been able to discover, it produces of itself but little disturbance.

III. *Torulus aggregatus* (Salisbury).—The individual spores of this plant when alone, or arranged in a moniliform manner, resemble the so-called torula cell (*Cryptococcus cerevisiæ*). They present, however, a very different appearance, when multiplying by duplicative segmentation and forming masses as represented at fig. 5. This vegetation is developed in and on the epithelium of the womb, producing a profuse discharge of a thick, ropy mucus; with inflammation, enlargement, and more or less induration of this organ. The spores are developed in the parent epithelial

and mucous cells, and in the fluid secretions. In these cases the catarrhal discharge is copious, thick, and often yellowish and greenish. I have only occasionally met with cases of this description.

Fig. 5 represents the spores, multiplying by duplicative segmentation, forming irregular masses or aggregations of spores; fig. 6, the individual spores developing by pullulation, and resembling the spores of the *cryptococcus cerevisiæ*; fig. 7 spores multiplying by duplicative segmentation, and arranging themselves in such a manner as to form broad filaments made up of aggregated spores.

This species sometimes becomes planted in the epithelium of the vulva, where it develops, producing more or less irritation and pruritus.

IV. *Torulus catarrhalis* (Salisbury).—The spores of this plant are frequently found in the mucous and epithelial cells, and fluid secretions of the womb, producing irritation, catarrh, and gradual enlargement and induration of the organ. The catarrhal discharge is thick, ropy, and often profuse. The tough ropiness of the discharge arises from the rapid development of the mucous cells into broad, strong filaments, which become united side to side, forming a tough, gelatinous, translucent mass. The spores of this vegetation are frequently planted in the epithelial cells of the vulva, where they rapidly develop, if the secretions of these parts are in a suitable condition, producing at times a most distressing pruritus. These are transferred or extend from cell to cell along the urethra, spreading to the bladder, ureters, and epithelium of kidneys, where they produce often considerable uneasiness and irritation. They are also sometimes transferred to the cells of the prepuce and urethra of the male, where they may produce one form of balanitis, and a urethritis resembling to some extent gonorrhœa.

The spores of this plant are represented at fig. 8. Fig. 12, spores developed in a parent epithelial cell of the bladder. Fig. 10, spores developing in the mucous cells from the womb. Fig. 11, these cells developing into broad filaments; along the cavity of which are the spores irregularly arranged. Fig. 9, represents an embryonic filament. Fig. 13, the mycelium of the fungus, developing from the spore. Fig. 14, a mass of epithelium, scraped from the vulva, in a distressing case of pruritus. It will be seen that the epithelial cells are filled with vegetating spores of the *Torulus catarrhalis*. The lady from whom this specimen was obtained, was suffering with severe catarrh of the womb. The catarrhal discharge contained very many spores of this fungus, and the spores were largely developed in the parent and mucous cells that escaped in the catarrhal discharge. The womb was enlarged, inflamed, and indurated; and the discharge was ropy, gelatinous, and profuse.

The disease yielded quite readily under the influence of free syringing with solution of bi-sulphite of soda morning and evening, after which di-

lute citrine ointment was applied, and tr. ferri chlorid. given internally in twenty drop doses two hours after each meal.

V. *Botrytis infestans*.—This fungus produces the so-called *potato rot*. It is occasionally found in and on the epithelium of the urinary organs, where its presence and development produce more or less irritation; and the urine contains, in greater or less quantity, the spores (figs. 16 and 17). The forms represented at fig. 16 are characteristic of this vegetation. In the mucous and epithelial cells in the urine, the spores of this plant will be found (fig. 15). In two of my patients, where this plant was largely present, there occurred severe attacks of erysipelas, accompanied and followed by profuse and protracted *hæmaturia*, which in one of the cases continued for over a year after the erysipelas passed away. During the continuance of the *hæmaturia*, the *B. infestans* was present in the urine. This, with the hemorrhage, gradually disappeared, under the influence of the constant administration of tr. ferri chlorid. The patient is now a strong, stout man, in perfect health. I have met with several cases where this vegetation produced severe pruritus of the urethra and vulva.

VI. *Zymotosis utero-catarrhalis* (Salisbury).—This is found in multitudes in the parent epithelial cells and secretions of the womb, in uterine catarrh. That its rapid development acts as an irritant there can be no doubt; but to what extent it may operate as a cause of the catarrhal inflammation and discharge is not known. The spores and filaments of this plant are represented at fig. 19.

VII. *Z. angularis* (Salisbury).—This is occasionally met with in and on the parent epithelial cells of the urinary organs. Its presence produces considerable irritation of the bladder, often with some little catarrhal discharge. The inside tube of the filament is interrupted at irregular intervals, and at these interruptions the filament frequently is abruptly bent, forming more or less obtuse or acute angles; hence the specific name. When this plant is developed in the urinary apparatus, the filaments are found in the freshly voided urine, either singly or in bundles or knots. The spores and filaments are represented in fig. 18.

VIII. *Z. oscillans* (Salisbury).—This occurs frequently in the parent epithelial cells and mucous secretions of the urinary apparatus; and the spores and filaments are found in greater or less quantity in the freshly voided urine. The embryonic filaments and spores are usually very active. The young filaments move rapidly in every direction with a vibrating motion, hence the specific name. This plant is represented in figs. 20 and 21. Where it is found largely in the urinary apparatus, there is usually a feeling of weight, an aching or uneasiness in the bladder; with a tired, languid feeling pervading the system. The embryonic filaments are either moniliform or have cross markings at short intervals. In the mature filaments the cross markings are obscure and often imperceptible.

IX. *Z. gracilis* (Salisbury).—This vegetation I have occasionally met with in the urinary organs in Bright's disease. The spores are very minute and the filaments very slender, with interruptions in the inside tube at regular intervals, producing the appearance of cross markings. I do not know that it produces any disturbance by its presence; though the probability is, that it does. Whether it acts as a cause or consequence of certain pathological states, is not known. The spores and filaments of this vegetation are represented at fig. 22.

X. *Z. elongatus* (Salisbury).—This I have only occasionally met with in the urinary organs; and when present there has always been more or less distress in retaining and voiding urine. The illustration, representing this plant, was drawn from the freshly voided urine of a Mr. E., of Cleveland, who had been suffering very much in retaining and voiding urine for the last twelve years. He had been repeatedly sounded for stone, but none found, and treated for gravel without benefit. This vegetation occurred in large quantity in this patient's urine. With it was a little stelline. The urine was light-coloured and had a density of about 1.020. This plant is represented at fig. 24.

XI. *Z. phosphaticus* (Salisbury).—This occurs quite frequently in phosphatic urine. The filaments are united frequently by a thin film or transparent membrane; which is a characteristic peculiarity. Whether it is a cause or simply the consequence of pathological states, is not known. The spores and filaments are represented at fig. 23.

XII. *Sarcina cystica* (Salisbury).—This may be the same as the *S. ventriculi*, which is found so often in the stomach. It appears to be, however, smaller, and tends to develop by segmentation, more in one direction than in the other, producing rows of cells, that at one end are frequently bent (fig. 33); on account of this apparent difference I have given it the specific name, *cystica*. I have found this plant in quite a number of cases in the urinary apparatus. Its presence seems to produce more or less irritation. It is represented at fig. 33.

XIII. *Spharotheca pyra* (Salisbury).—This plant, which produces the blight in the apple, pear, and quince trees, and the rot in their fruit, is occasionally met with in the urinary organs. I have not been able to discover that it produces much disturbance. Its presence and propagation in these parts is probably more a consequence than a cause of certain pathological states.

XIV. *Crypta irregularis* (Salisbury).—This is met with in cases of ulceration of the urethra and bladder, arising from severe and long continued venereal disease. The vegetation is voided with the shreds and ropes of muco-pus, that are passed in such cases. It is represented in figs. 25, 26, and 27. Figure 25 represents the spores, and figs. 26 and 27 the filaments.

The filaments are more or less irregular in diameter, having usually

somewhere in their course bulbous dilatations. In advanced stages of development, they are quite homogeneous throughout their entire length. In earlier stages of growth, they exhibit transverse markings at tolerably regular intervals (fig. 26). The filaments represented at fig. 26, are from an ulcerated urethra, in a severe case of gonorrhœal inflammation, complicated with a urethral chancre, where the disease had been allowed to run two weeks without treatment.

The plants, represented in fig. 27, are from a young man who had suffered for several years, almost constantly, with gonorrhœal and chancre diseases. In both these cases, considerable blood was voided with the pus.

ANIMAL PARASITES. I. *Trichina cystica* (Salisbury).—This is a small species of trichina, which I have found in the human bladder. In all my examinations, I have met with this little entozoon in three cases only. In two of these it was only occasionally met with in the urine. In the other, a Mrs. R., of Cleveland, it occurred in great numbers. Frequently from ten to fifteen ova were found in a single drop of urine. The eggs, containing the animal in various stages of development, are represented at figs. 29 and 30. These are magnified 300 diameters. The animal magnified about 1000 diameters is represented at fig. 31. This patient was an old lady, aged about 65. She had cystic rheumatism, and was partially paralyzed, and had been insane for several years. She was labouring under severe cystinemia, which was regarded as the main cause of the rheumatism and paralysis. When this patient came into my hands, there was from five to fifteen ova (figs. 29 and 30) in every drop of urine voided. Her urine was passed milky, with granular cystine, and was dense and scanty. There was partial paralysis of the bladder, so that her water was constantly dribbling from her. The surface of the body, and especially the limbs, were covered with purple spots, from one to six lines in diameter. Around the ankles, these spots, some weeks before death, became gangrenous and sloughed, leaving offensive sores. The blood was black and thick, and the pulsations slow and irregular. Heart sounds normal. No examination was made of the muscles after death to determine whether this species burrowed in this tissue, like the *spiralis*.

It may be interesting to state here the singular fact, that all of the members of this family for several generations back, at about the age of 60, have gradually become insane, and at the same time affected with chronic rheumatism and with more or less paralysis. All the younger members of the family are in constant dread of arriving at this age, as they seem to be impressed with the idea that they are all to go in the same way.

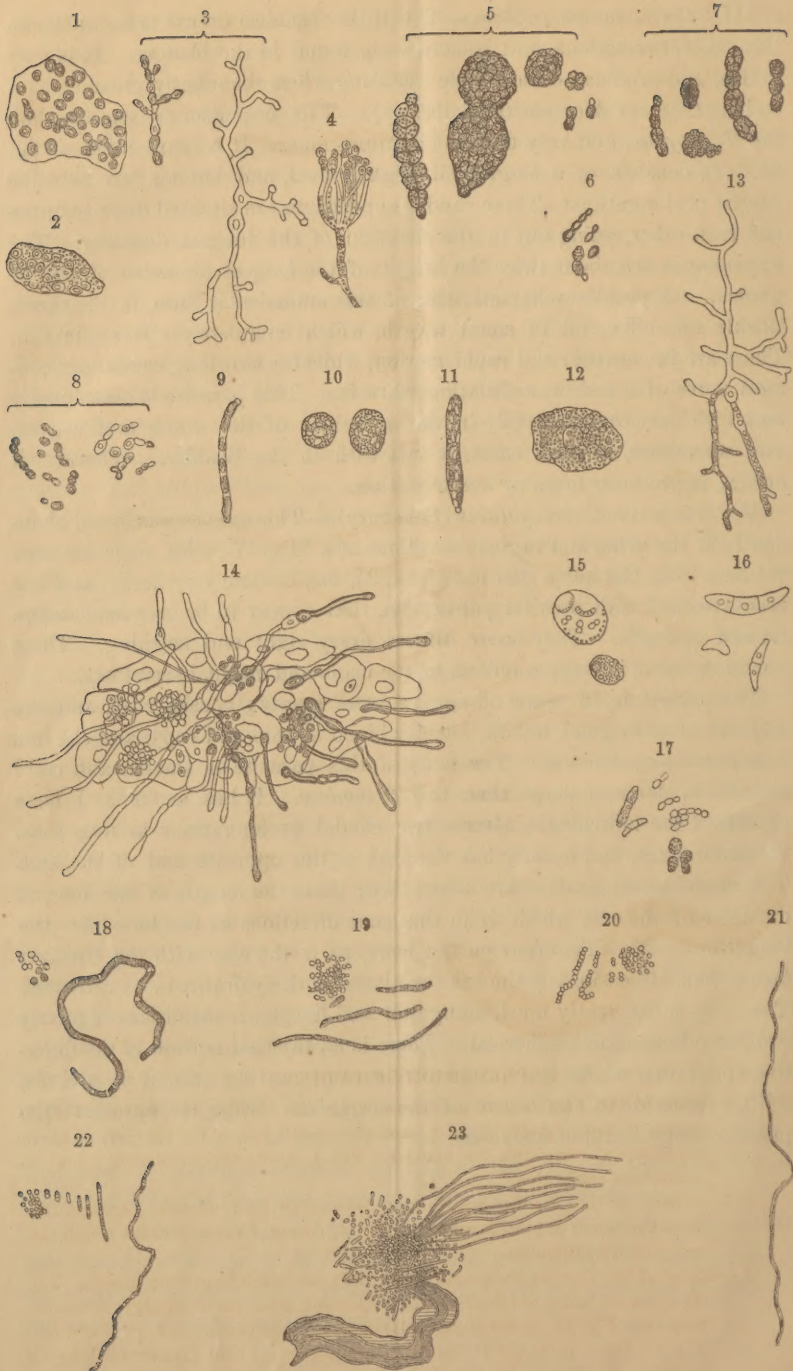
II. In a few instances I have met with a species of *vibrio*, resembling that found in vinegar, in the freshly-voided urine. In all cases where I have found this little animal in the urine, the patients have been debilitated and the urine rancid and fermenting.

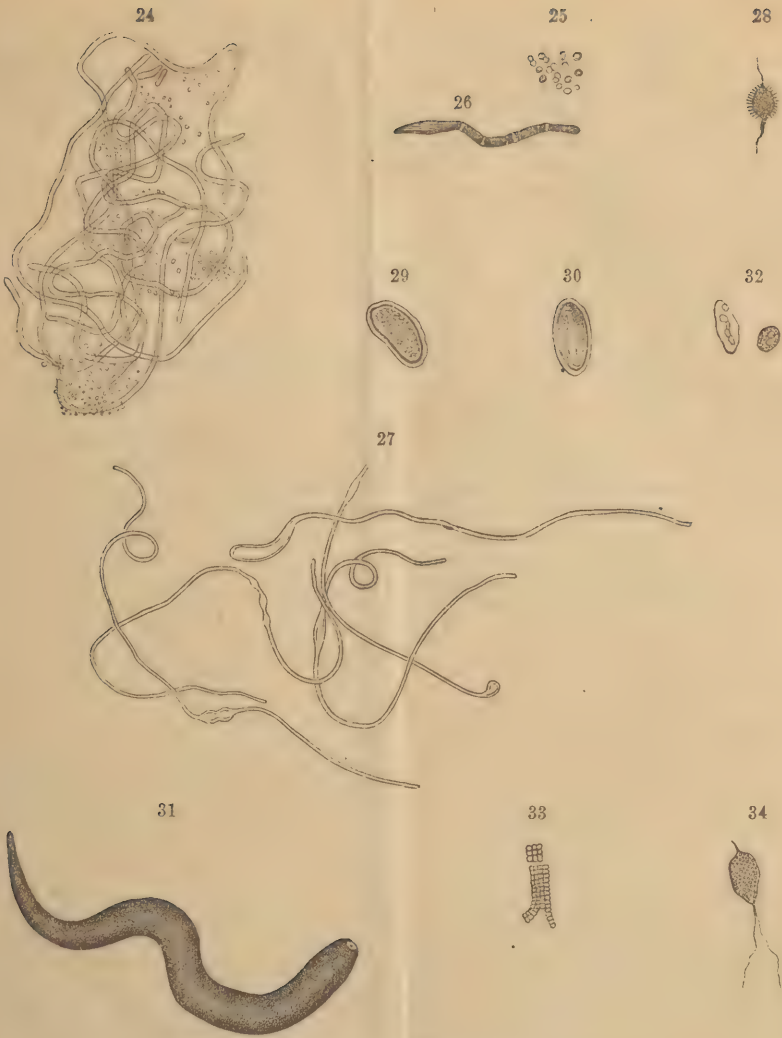
III. *Trichomonas vaginæ*.—This little organism occurs occasionally in the vaginal secretions, and sometimes is found in the bladder. It is very active, and produces considerable irritation when abundantly present.

IV. *Ciliaris bicaudalis* (Salisbury).—This organism is smaller than the *T. vaginæ*, and very different in appearance. It is represented at fig. 28. It consists of a single cell, slightly oval, and having two hair-like caudal prolongations. These caudal appendages are situated directly opposite each other, going out in the direction of the longest diameter. The appendages are about twice the length of the longest diameter of the organism. A peculiar characteristic of this animalcular form, is the short, thickly set, ciliæ, all of equal length, which completely cover the cell. These are in constant and rapid motion, while the two long caudal appendages move with a slow, undulating vibration. This parasite is occasionally met with developing rapidly in the secretions of the womb and vagina, and sometimes, in such cases, is met with in the bladder. Wherever it occurs, it produces more or less irritation.

V. *Trichomonas irregularis* (Salisbury).—This species was found abundantly in the urine and vaginal secretions of a Miss W., who, since her arrival here from Germany (ten months ago), has become very fleshy, and has been attacked with peculiar paroxysms, that appear to be between cataleptic and epileptic. They occur almost every night and morning. These parasites occur in large numbers in the urine and vaginal secretions.

The patient is 16 years of age; courses scanty; cheeks rosy, and she appears to be in good health, but her blood is thin and ropy, and she has considerable *cystinemia*. The body of this parasite is smaller and more variable in size and shape than the *T. vaginæ*. It has, as far as I have examined the individuals, always two caudal prolongations arising from the same point, and usually has the beak at the opposite end of the cell. The caudal prolongations are about three times the length of the longest diameter of the cell, which is in the same directions as the hair-like prolongations. No ciliæ occur on the body, as is the case with the *Ciliaris bicaudalis*. Occasionally the beak is almost entirely drawn in or retracted. The body is frequently much elongated and irregular, sometimes regularly oval, at others almost spherical. There is an internal motion in the digestive apparatus, which is a progressive current moving around in a circle, a little posterior to the centre of the organism. Fig. 34 represents the parasite magnified 300 diameters.





EXPLANATION OF FIGURES.

- FIG. 1.—Spores of the *Penicillium pruriosum*, from the bladder and vulva. FIG. 2, spores of same developing in a parent epithelial cell of the bladder. FIG. 3, mycelium of same from the bladder. FIG. 4, fertile thread bearing spores of same from the bladder.
- 5, 7.—Spores of the *Torulus aggregatus*, developing by duplicative segmentation from the womb in uterine catarrh. FIG. 6, spores of same from the womb, developing by pullulation.
- 8.—Spores of the *Torulus utero-catarrhalis*, from the womb in uterine catarrh. FIG. 9, spore of same developing into a filament from the discharge in uterine catarrh. FIG. 10, spores of same developing in the mucous cells of the womb. FIG. 11, the mucous cells (fig. 10) developing into broad filaments filled with spores of the *T. utero-catarrhalis*.

- 12.—Spores of the *T. utero-catarrahalis*, developing in a parent epithelial cell of the bladder. Fig. 13, mycelium of same developing from the spore.
- 14.—A mass of epithelium, scraped from the vulva, in a distressing case of pruritus. The epithelial cells are filled with vegetating spores of the *T. utero-catarrahalis*.
- 15.—Spores of the *Botrytis infestans*, developing in the mucous cells from the bladder. Figs. 16 and 17, spores of same from the urinary organs.
- 18.—Spores and filaments of the *Zymosis angularis* from the bladder.
- 19.—Spores and filaments of the *Z. catarrahalis*, from the womb, in uterine catarrh.
- 20, 21.—Spores and filaments of the *Z. oscillans* from the urinary organs.
- 22.—Spores and filaments of the *Z. gracilis* in the urine in Bright's disease.
- 23.—Spores and filaments of the *Z. phosphaticus* from phosphatic urine.
- 24.—Spores and filaments of the *Z. elongatus* from the urinary organs in a case of irritable bladder.
- 25, 26, 27.—Spores and filaments of the *Crypta irregularis*, from the urethra and bladder, in ulcerations of these parts produced by venereal disease.
- 28.—*Ciliaris bicaudalis*, a minute animalcular parasite found developing occasionally in the female genital organs.
- 29, 30.—The ova of the *Trichina cystica*, found occasionally developing in the human bladder, magnified 300 diameters. Fig. 31, the parasite, after its escape from the egg, magnified about 1000 diameters.
- 32.—Mucous cell of the womb, with its granules destroyed by the presence and development in it of spores.
- 33.—*Sarcina cystica* from the human bladder.
- 34.—*Trichomonas irregularis* magnified 300 diameters.

